Sustainability Management Plan

100 Swan Street, Richmond VIC

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23/04/2025

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a part of Sustainability Tech Partners Pty Ltd

Sustainability Management Plan (SMP)

Proposed Alteration and Addition

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DOCUMENT VERSION

Version	Date	Changelog	Author	Review
0	26/05/2025	Issued for Client Review (FCS 64751)	WZ	DG
1	24/06/2025	As per clients' comments (FCS 64751)	WZ	-
2	21/04/2026	Updated as per latest plans (FCS 69229)	AT	-
3	23/04/2026	Updated WSUD (FCS 69229)	AT	-

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INITIATIVES TO BE MARKED ON DRAWINGS

Water & Stormwater Management

- Mark-up showing roof catchment area to be diverted to the Rainwater tank – If required, the use of charged pipe system will be explicitly acknowledged on the drawings and charged pipes will not be running underneath the building footprint.
- Location and size of each Rainwater tank proposed
- Note showing connection to the toilets and urinals.
- Minimum of 191m^2 of permeable paving (beer/garden and circulation area)
- Note showing WELS rating for water fittings/fixtures (refer to report) – Fixtures (e.g. dishwasher) provided as part of base building work have to be chosen within one WELS star of best available at the time of purchase.

Energy Efficiency

- Note showing commitment to exceeding section J energy efficiency requirement of NCC 2019
- Note showing the maximum illumination power density (W/m^2) of the development meet the requirements in NCC 2019
- Lighting sensors for external lighting (motion detectors, timers etc.)
- Minimum of 7kW Solar PV system on the roof of the development

Indoor Environment Quality

- Note showing commitment to Outside Air Fan in the new regularly used areas providing O/A rates 70% above minimum from AS1668 or O/A provision to ensure CO2 concentration remains below 600ppm
- Glazing to improve daylight performance by maximising VLT targeting 40%

Construction

- Building User's Guide (BUG) will be developed and made available to all owners and occupants

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INTRODUCTION

Frater Consulting Services have been engaged to undertake a Sustainability Management Plan for the proposed development located at 100 Swan Street, Richmond. This has been prepared to address the Yarra City sustainability requirements especially Clause 15.01-2L-01 *Environmentally Sustainable Development.*

Within Clause 15.01-2L-01, Yarra City Council has identified the following key categories to be addressed

- Energy Performance;
- Water Resources;
- Stormwater Management;
- Indoor Environment Quality;
- Building Materials;
- Construction, Building & Waste Management;
- Transport; and
- Urban Ecology / Innovation.

The site has been assessed using the BESS tool. BESS was developed by association of councils led by Merri-bek City Council. This tool assesses the energy and water efficiency, thermal comfort and overall environmental sustainability performance of new buildings or alterations. It was created to demonstrate how new development can meet sustainability requirements as part of a planning permit application for the participating council.

Each target area within the BESS tool generally receives a score of between 1% and 100%. A minimum score of 50% is required for the energy, water, stormwater and IEQ areas. An overall score of 50% represents 'Best Practice' while a score over 70% represent 'Excellence'. The result of the BESS assessment is included as Appendix E.

This site has been assessed using the Blue Factor Calculator. New developments are required to meet planning requirements including stormwater management objectives. Blue Factor can help assess how much stormwater runoff and pollutants are created from a development and what treatment measures are needed to comply with these objectives and planning requirements including stormwater management quality objectives in the Urban stormwater management guidance (EPA, 2021).

Kindly note that the scope of this report is limited to new works only. Existing areas and elements are to remain unchanged and are excluded from assessment

bess
Built Environment Sustainability Scorecard

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SITE DESCRIPTION

The proposed site is located at 100 Swan Street, Richmond. The 845m^2 site is currently occupied by the existing Richmond Club hotel, the proposed development is a proposed alteration and addition. It is located approximately 4kms east of the Melbourne CBD.

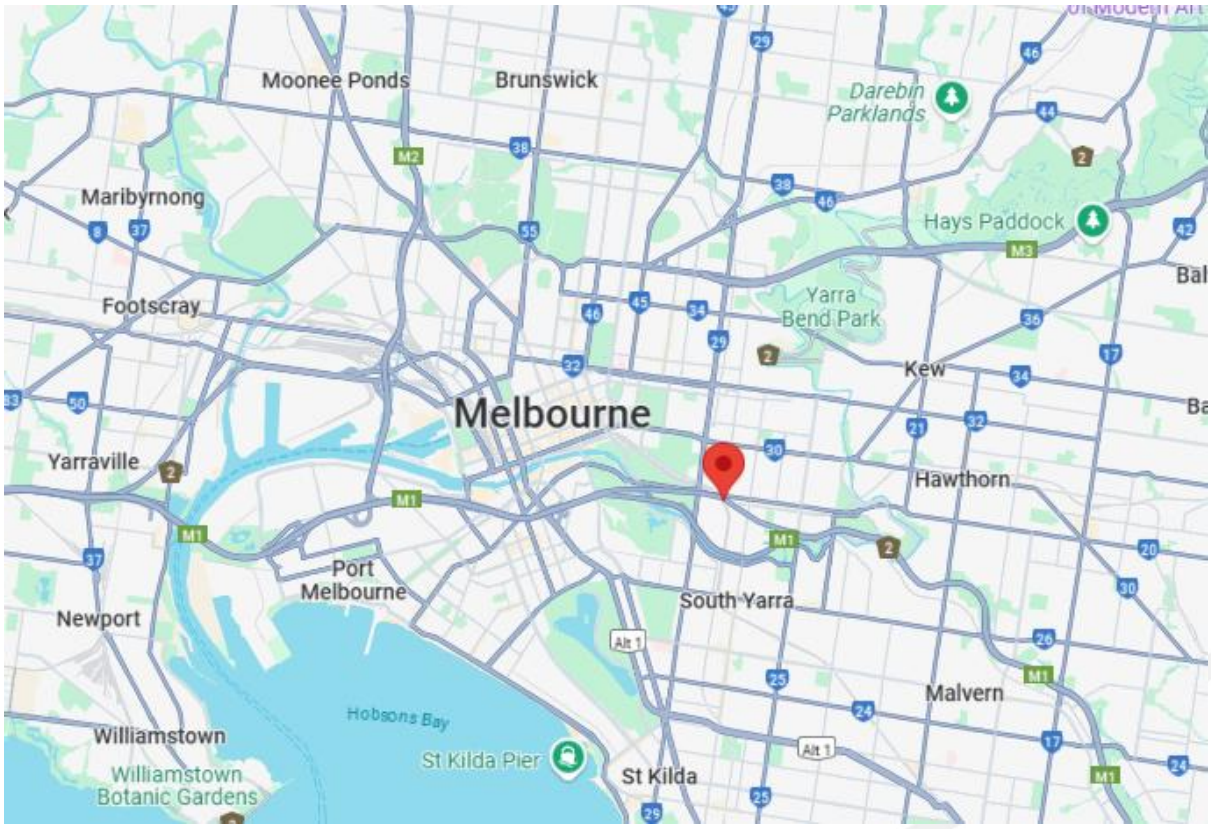

Figure 1: Location of the proposed development in Richmond with relation to Melbourne CBD (Source: Google Maps)

PROPOSED DEVELOPMENT

The proposal consists of the alteration and addition to the Richmond Club Hotel. The area of the site is approximately 845m^2. The proposed extension will include new bar areas, offices, karaoke areas, and kitchens. The total venue capacity is 1200 people.

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ENERGY EFFICIENCY

Energy and its key elements should be integrated into the design of the proposed development. These elements contribute to reducing greenhouse gas emissions by utilising energy efficient appliances, energy conservation measures and renewable energy.

Energy Efficiency

Prior to the building construction stage of the project, a section J (NCC 2019) DTS assessment will occur with the following commitments:

- 10% improvement on floor and ceiling insulation level requirement from NCC 2019;
- Wall and glazing performance to be in line with DTS requirements
- Heating/cooling system to be chosen within one star of the best available product in the range at the time of purchase or COP/EER 85% or better than most efficient equivalent capacity unit available if no star rating is available; and
- Water heating system to be chosen within one star of the best available product in the range at the time of purchase or 85% or better than most efficient equivalent capacity unit available if no star rating is available.

Alternatively, prior to the building construction stage of the project, energy modelling will occur with the aim of exceeding requirement of NCC 2019, using an NCC JV3 modelling process. This will be achieved through the use of high-performance building fabric and glazing, low energy lighting and building services. **The reference building model will include the minimum improvement committed above for floor and ceiling.** This method will allow for flexibility in for glazing performance. Results in BESS using JV3 approach would yield a slightly lower score under BESS Energy 1.1 however our BESS assessment has been prepared to ensure that energy section and overall compliance is maintained.

Heating and Cooling Systems

To reduce the energy consumption heating and cooling will be provided by energy efficient air conditioners (chosen within one star of the best available product in the range at the time of purchase or COP/EER 85% or better than most efficient equivalent capacity unit available if no star rating is available).

Hot Water Heating

Hot water will be provided with efficient electric instantaneous systems. Hot water usage within the development will be low.

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Lighting

The maximum illumination power density (W/m^2) of the development will meet NCC 2019 requirements in by the use of LED throughout the development.

Lighting Sensors

Common areas and transient spaces will be controlled using occupancy sensor and/or daylight sensors. Ventilation in these areas will be controlled using timers and other sensors.

Solar PV System

A 7kW solar photovoltaic for renewable energy generation will be installed on the roof of the development. This will off-set a portion of greenhouse gas emissions and energy use for the project (lighting, pumps etc.).

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WATER EFFICIENCY & STORMWATER MANAGEMENT

Water saving-use and reuse and its key elements should be integrated into the design of the proposed development. These principles contribute to reducing the water demand in addition to promoting water reuse. Stormwater management and its key elements should be integrated into the design of the proposed development. These principles contribute to ensuring natural systems are protected and enhanced whilst promoting on-site retention and aims to reduce runoff or peak flows.

Water Efficient Fittings

The development will include efficient fittings and fixtures to reduce the volume of mains water used in the development. The following WELS star ratings will be specified;

- Toilets – 4 Star;
- Urinals – 5 Stars;
- Taps (bathroom and kitchen) – 5 Star;
- Showerhead if provided – 4 Star with aeration device (6.0-7.5L/min); and
- Dishwasher – 5 Star.

Rainwater Collection & Use

Rainwater runoff from the roof area will be collected and stored in rainwater tanks[1] with a total effective capacity of 10,000L for the development.

Rainwater collected will be used for toilet and urinal flushing throughout the development. These initiatives will reduce significantly the stormwater impacts of the development and help achieve compliance with the BlueFactor calculator (See Appendix A).

Stormwater Treatment – Permeable Paving

A minimum of 191m^2 of beer/garden and circulation area will be designed to be permeable. This will help towards reducing the overall stormwater outflows from the site

Water Efficient Appliances

All appliances provided in the development as part of the base building work (e.g. dishwasher) will be chosen within one WELS star of the best available.

[1] Please note that any stormwater detention volume requirement for the site will be in addition to the proposed rainwater retention and that the proposed tank will not be directly topped up by mains water.

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INDOOR ENVIRONMENT QUALITY

Indoor Environment Quality and its key elements should be integrated into the design of the proposed development. These elements play a significant role in the health, wellbeing and satisfaction of the development occupants. Facilitating a good (IEQ) design provides a naturally comfortable indoor environment and less dependence on building services such as, artificial lighting, mechanical ventilation and heating and cooling device.

Volatile Organic Compounds

All paints, adhesives and sealants and flooring will have low VOC content. Alternatively, products will be selected with no VOCs. Paints such as eColour, or equivalent should be considered. Please refer to Appendix D for VOC limits.

Formaldehyde Minimisation

All engineered wood products will have 'low' formaldehyde emissions, certified as E0 or better. Alternatively, products will be specified with no Formaldehyde. Products such as ecological panel – 100% post-consumer recycled wood (or similar) will be considered for use within the development. Please refer to Appendix D for formaldehyde limits.

Daylight Levels

Daylight inputs through windows/openings for the new regular areas such as the bar areas will be enhanced with the use of light internal colours, allowing better internal reflection of daylight. Most of the new areas will have large glazing to allow for good daylight penetration. The new areas will achieve good daylight amenities (beyond compliance with the SDAPP guidelines).

Please refer to appendix C for daylight Hand Calculation showing compliance with best practice requirements.

Natural and Mechanical Ventilation – Improved Outside Air Rates

Natural ventilations are provided for the internal areas through the bi-fold windows in the first floor and the retractable awning on the second floor.

All new regularly used areas will be provided with O/A fans which will commit to provide 70% increase on O/A provision from AS1668.

Alternatively, O/A will be provided in the regularly used areas to ensure that CO2 concentration in the rooms remains below 600ppm.

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CONSTRUCTION, BUILDING & WASTE MANAGEMENT

Building Management and its key elements will be integrated into the design of the proposed development. These principles contribute to ensuring efficient and effective on-going building performance. Waste management and its key elements will be integrated into the design of the proposed development. These principles contribute to ensuring minimal waste is transported to landfill by means of disposal, recycling and on-site waste storage and/or collection methods.

Metering and Monitoring

The development will be separately metered for potable water and energy. Effective metering ensures that tenants are responsible for their consumption and they can reduce their consumption.

Construction Waste Management

A waste management plan will be introduced to all on-site staff at a site orientation session to ensure that the waste generated on site is minimised and disposed of correctly. A minimum 80% of all construction waste generated on site will be reused or recycled.

Construction Environmental Management

The builder will identify environmental risks related to construction and include management strategies such as maintaining effective erosion and sediment control measures during construction and operation and ensure that appropriate staging of earthworks (e.g. avoid bare earthworks in high risk areas of the site during dominant rainfall period).

Building Users Guide

A Building User's Guide (BUG) will be developed and made available to all owners and occupants. Generally the guide should include the following information:

- A description of operational and maintenance requirements of the heat and cooling systems and hot water systems for efficient and safe use of these systems;
- A description of operational and maintenance requirements of building initiatives to reduce energy and water use;
- A description of operational and maintenance requirements of water sensitive urban design features;
- A description of operational and maintenance requirements of waste management strategy; and
- Transport facilities including public transport information.

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Operational Waste

A dedicated storage area will be provided in the development. The storage area will be sufficiently sized to accommodate the general and recycling waste. Recycling facilities will be as conveniently accessible as the general waste facilities.

Universal Access

The development will be designed for universal access in accordance with AS1428.2 to allow persons with limited mobility to enter and use the premises.

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BUILDING MATERIALS

Materials selection should be integrated into the design of the proposed development. The criteria for appropriate materials used are based on economic and environmental cost.

Timber

All timber used in the development will be Forest Stewardship Council (FSC) or Program for the Endorsement of Forest Certification (PEFC) certified, or recycled / reused.

Flooring

Wherever possible, flooring will be selected from products/materials certified under any of the following:

- Carpet Institute of Australia Limited, Environmental Certification Scheme (ECS) v1.2;
- Global GreenTag - https://www.globalgreentag.com/; and/or
- Good Environmental Choice (GECA).

Joinery

Where possible, joinery will be manufactured from materials/products certified under any of the following:

- Global GreenTag - https://www.globalgreentag.com/; and/or
- Good Environmental Choice (GECA); and/or

Steel

Wherever possible, steel for the development will be sourced from a Responsible Steel Maker[2]. Reinforcing steel for the project will be manufactured using energy reducing processes commonly used by large manufacturers such as Bluescope or OneSteel.

[2] A Responsible Steel Maker must have facilities with a currently valid and certified ISO 14001 Environmental Management System (EMS) in place, and be a member of the World Steel Association's (WSA) Climate Action Program (CAP).

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URBAN ECOLOGY

Insulant ODP

All thermal insulation used in the development will not contain any ozone-depleting substances and will not use any in its manufacturing.

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IMPLEMENTATION & MONITORING

The proposed development will meet the best practice requirement of the City of Yarra through the different initiatives describe in this report such as thermally efficient building envelope, efficient air conditioning and hot water system and sustainable materials. An appropriate implementation and monitoring of the initiatives outlined within this report will be required.

Implementation of the ESD initiatives outlined in this report requires the following processes:

- Full integration with architectural plans and specifications
- Full integration with building services design drawings and specifications
- Endorsement of the ESD Report with town planning drawings
- ESD initiatives to be included in plans and specifications for building approval

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APPENDIX A – WSUD REPORT / BLUEFACTOR ASSESSMENT

New development must comply with the best practice performance targets for suspended solids, total phosphorous and total nitrogen, as set out in the Urban Stormwater Best Practice Environmental Management Guidelines, Victoria Stormwater Committee 1999. Currently, these water quality performance targets require:

- Suspended Solids - 80% retention of typical urban annual load.
- Total Nitrogen - 45% retention of typical urban annual load.
- Total Phosphorus - 45% retention of typical urban annual load.
- Litter - 70% reduction of typical urban annual load.

To assess these initiatives, the Blue Factor tool – which is an industry-accepted tool – is used to comply with these initiatives. The results are presented in this report.

Site Delineation

For the purpose of the assessment, the development has been delineated into the following surface types:

- Site area of 845m^2;
- Roof area runoff of 374m^2 which will be diverted into rainwater tank(s);
- The beer/garden and circulation area of minimum of 191m^2 of paving will be designed as permeable; and
- Remainder of impervious areas of 280m^2 comprised of unconnected roof areas and other impervious areas around the site.

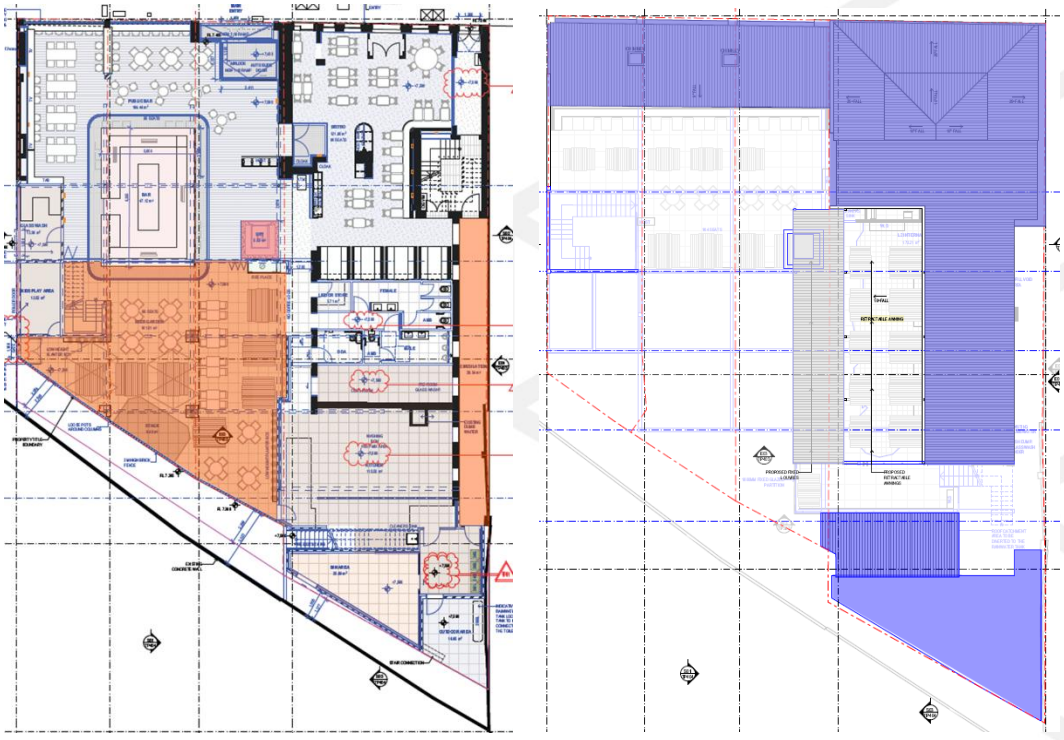

Figure 2: Roof catchment area to RWT (blue), Beer/garden and circulation area paving to be designed as permeable (orange)

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Stormwater initiatives

Rainwater Tank
(Rainwater tank for toilet and urinal flushing)

The roof catchment area (as described above) will be diverted to rainwater tank(s) with an effective capacity of 10,000L for the development. The rainwater collected will be used for toilet and urinal flushing in the development.

If required, a charged pipe system or multiple tanks will be installed to collect water from part of the roof of each dwelling.

Permeable Paving

A minimum 191m^2 of paving in the beer/garden and circulation area (as described above) will be designed to be permeable. This will reduce the overall stormwater runoff from part of the site.

The remainder of impervious areas will directly be released at the legal point of discharge on site.

Stormwater Results

The initiatives and areas described above have been applied to the BlueFactor calculator and the proposed development has achieved a score of **103%.**

It should be noted that rainwater tank is connected to all toilet and urinals. 700 occupants and 19 toilets were input in the Blue Factor assessment.

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Project # 9FF60B13
V3: 94-100 Swan Street, Richmond
Angelette Tanjuatco - angelette@fraterconsultingservices.com.au
94 Swan St, Richmond VIC 3121, Australia
23 April 2026 12:19 p.m.

BLUE FACTOR®

94-100 Swan Street, Richmond

103%
SCORE

The proposed stormwater treatments provide 'deemed to comply' compliance with the minimum planning requirement for total nitrogen but does not comply with all the relevant objectives for management of stormwater flows on-site.

Project details

Name	V3: 94-100 Swan Street, Richmond
Project ID	9FF60B13
Street address	94 Swan St, Richmond VIC 3121, Australia
Municipality	Yarra Ranges
Site area	845 m^2
Planning Number	

Flow and pollutant load reductions

Item	Result	Target	
Mean annual runoff volume harvested or evapotranspired (%)	46%	>20%	✓
Mean annual runoff volume infiltrated or filtered (%)	0%	>17%	✗
Total suspended solids (%)	49%	>80%	✗
Total phosphorus (%)	48%	>45%	✓
Total nitrogen (%)	46%	>45%	✓
Total gross pollutants (%)	56%	>70%	✗

Warning: Warning high demand adopted relative to catchment. Consider reducing demands or increasing catchment area

Water treatment

Roof to RWT

Roof area to RWT 374m2

Rainwater Tank 1
Rainwater tank retention volume in kilolitres: 10

Catchments

Roof area to RWT 374m2

Minimum area to be permeable
Pervious (garden and lawn), 191m2

Impervious area (Unconnected roof area, and rooftop)
Paved, 280m2

Treatments

Rainwater Tank 1
Rainwater tank retention volume in kilolitres: 10

181%

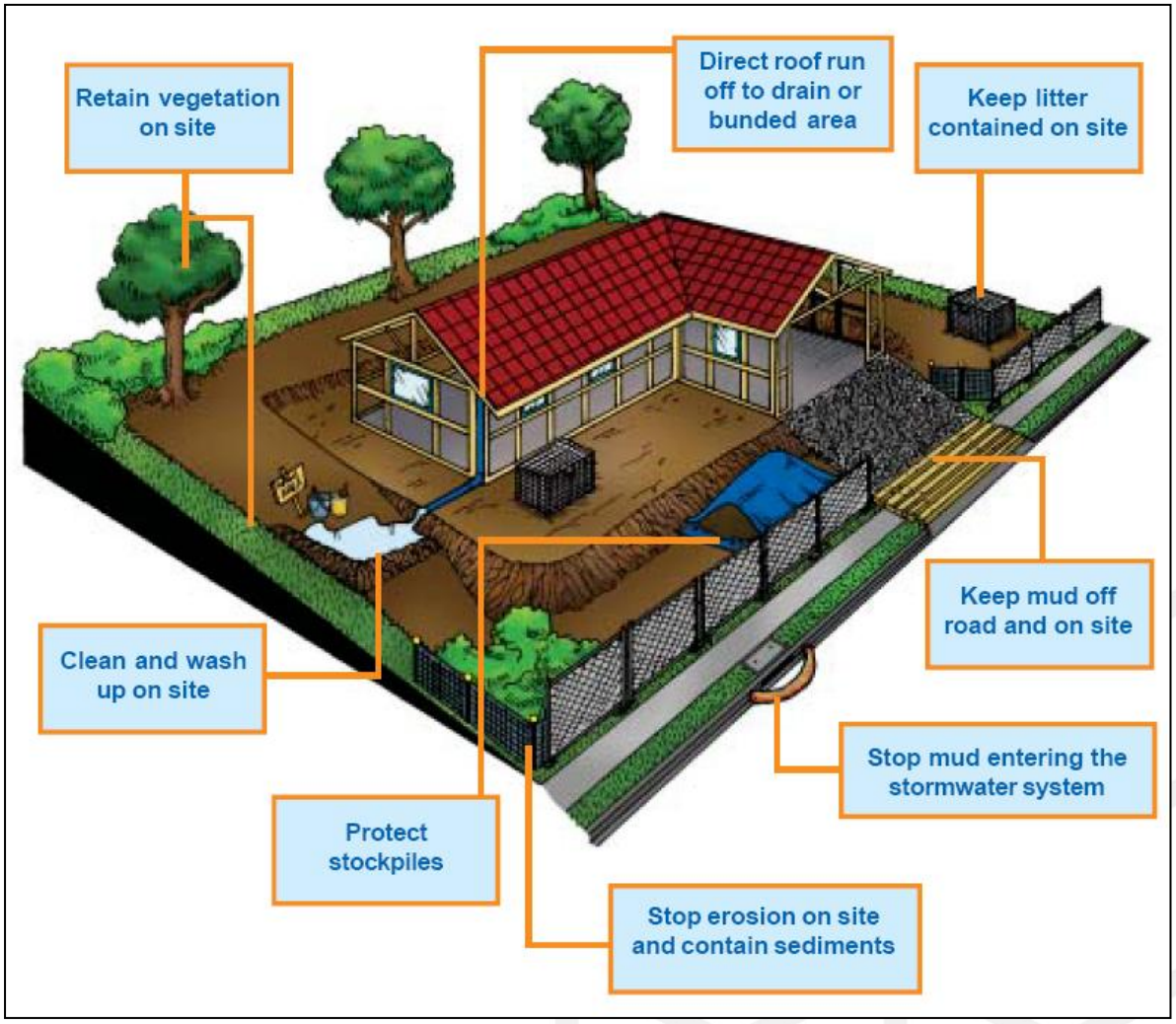
Buildings & dwellings

Richmond Club Hotel
Non-Residential BCA Class 5 - Commercial/Office,
700 employee(s)

Water sources	I want to calculate my water use based on fixtures and fittings
Basin taps - Primary water source	Mains water
Basin taps - Efficiency	5 star WELS rating
Showers - Primary water source	Mains water
Showers - Efficiency	Scope out
Clothes Washer - Primary water source	
Clothes Washer - Efficiency	Scope out
Urinal - Primary water source	Rainwater
Urinal - Efficiency	4 star WELS rating
Toilets connected to mains water	0
Toilets connected to rainwater	19
Toilets connected to recycled water	0
Toilets efficiency	4 star WELS rating
Garden water use	Garden water demands are not in use

Stormwater Management at Construction Site

To manage stormwater management in the construction stage, measures will be put in place to minimise the likelihood of contaminating stormwater. This will mean ensuring buffer strips are in place, sediment traps are installed, and the site will be kept clean from any loose rubbish. The builder will follow the process outlined in "Keeping Our Stormwater Clean – A Builder's Guide" by Melbourne Water.



Copies of "Keeping Our Stormwater Clean – A Builder's Guide" can be downloaded from the following website.

https://www.clearwatervic.com.au/resource-library/guidelines-and-strategy/keeping-our-stormwater-clean-a-builders-guide.php

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APPENDIX B - WSUD MAINTENANCE & INSTALLATION

Installation

Rainwater Tank(s)

The rainwater tank(s) will be installed above ground. Its manufacturer or material has not been nominated. It will be installed with a mesh insect cover over the inlet pipe to ensure the tank does not become a breeding ground for pests. Mesh needs to be installed over overflow pipes and if a manhole is present it needs to be properly sealed.

Please refer to the architectural drawings for the location of the rainwater tank.

Pumps

The pumps required either to divert the stormwater runoff to the rainwater tank or to distribute the collected water to the end use (toilets and urinals) will be required to be installed as per the chosen manufacturer specifications.

Permeable Paving

Permeable paving areas shall be installed in strict accordance with the site plans and the permeable paving manufacturer's specific drawings and requirements.

Inspection Requirements

Rainwater Tanks

Inspections of roof areas and gutters leading to the tank should take place every 6 months. Rainwater in the tanks should be checked every 6 months for mosquito infestation.

The rainwater tank should be examined every 2 years for sludge buildup.

Ensure the monitoring system (be it digital or a simple float system) is functioning properly by checking the water level in the rainwater tanks.

Pumps

The pumps required will be required to be routinely inspected by listening for the day-to-day operation of the pumps. Unusual noise or no noise should be investigated. Inspection should occur as per the chosen manufacturer's specifications.

Permeable Paving

Permeable paving should be inspected for damage after large storm events (48.2mm in one hour is considered a large storm event in Melbourne – 1 in a 100-year storm) and should be inspected every 3 months.

During the inspection, the following should be looked for:

- Water ponding on porous joints or permeable pavers;
- Soggy and boggy soils;

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- Uneven surface;
- Rubbish, leaf litter and sediment; and
- Blocked underdrainage.

Clean Out / Maintenance Procedure

Rainwater Tank, Roof and Gutters

Rainwater tanks will require the roof and gutters onsite to be maintained; gutters should be checked, maintained and cleaned every six months to avoid blockages from occurring. If a leaf-blocking system is installed this can be completed annually.

Any trees onsite should be maintained every 6 months with branches overhanging the roof removed.

Water ponding in gutters should be avoided as this provides a breeding ground for mosquitos; tanks should also not become breeding grounds for mosquitoes. If mosquitoes are detected in the tank remedial steps need to occur to prevent breeding. If mosquitoes or other insects are found in rainwater tanks, the point of entry should be located and repaired. As well as preventing further access, this will prevent the escape of emerging adults. Gutters should be inspected to ensure they do not contain ponded water and be cleaned if necessary.

Please refer to https://www.health.vic.gov.au/sites/default/files/2022-11/Keeping-your-rainwater-tank-safe-from-mosquitos.pdf for more information on mosquito control.

Rainwater tanks should be checked by a regular maintenance person every 3-6 months to ensure that connection to the building is maintained and there are no blockages.

A simple way to ensure the tank is operating as intended would be through the installation of a smart monitoring device (e.g. OneBox®). These systems allow users to operate tanks remotely from the internet or smartphone, monitor and control the tanks in real time, allow the automatic release of stored water prior to storm events, alert users if there is any blockage and view tank history and usage patterns.

Alternatively, onsite tank gauges can help those familiar with the tank know if the tank is not working correctly.

Pumps

Maintenance should occur as per the chosen manufacturer's specifications. All strainers and filters should be cleaned every 6 months. Good quality pumps should provide trouble-free service for up to 10 years.

Permeable Paving

Permeable paving will require ongoing maintenance based on the inspection. The following maintenance task could be required:

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Item	What to check for	Inspected	Maintenance undertaken	Further action required or comment
Civil components – Permeable pavement				
Permeability	Pavement area is free draining (i.e. no clogging of the pavement surface). Clogging is generally evident by water ponding on the surface of the permeable paving more than 2 hours after rainfall.			
Pavement surface	No uneven paver surface (i.e. pavement surface lifting and rutting). No physical damage to the pavement surface – look for cracks and holes.			
Infill material	Infill material is present between pavers. No scour occurring.			
Landscape components – Permeable pavement				
Weeds	Less than 10% of infill surface area (where present) covered by weeds.			

Commissioning

Rainwater Tank

All rainwater tanks should be washed or flushed out prior to use. All inlets and outlets should be correctly sealed to prevent insects from entering. Connection to all toilets and urinals in the development should be tested (dye test or equivalent).

Please note if the roof coating or paint is to be installed then the first few run-offs after installation need to be discarded.

Pumps

Commissioning should occur as per the chosen manufacturer's specifications.

Permeable Paving

Commissioning should occur as per the chosen manufacturer's specifications.

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Summary

The following needs to occur onsite to ensure compliance with WSUD requirements and maintain the operation of the rainwater tank and connections onsite.

Task	When?	Requirement
Inspect Rainwater tanks	Every 6 months	• Check for any damage/compression • Mosquitoes infestation
	Every 2 years	• Sludge Build up – if sludge build-up occurs a vacuum tank needs to be called out to the site.
Inspect roofs & gutters	Every 6 months	• Clean out of leaves/debris. • Remove any overhanging branches onsite.
Inspection of Permeable Paving	3-Monthly Following a large storm event	• Check joints • Check soil • Check for blockages • Check for ponding • Check for uneven surfaces

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APPENDIX C – DAYLIGHT ACCESS – GREEN STAR CALCULATION

The Green Building Council of Australia (GBCA) has created a daylight access calculation method within the Green Star benchmarking tool. This tool is widely recognised by Councils and Industry.

The Green Star Daylight Hand Calculation method is used to determine if there are risks associated with the current design, particularly with respect to meeting the desired daylight factors referenced in the Sustainable Management Plan in the Planning Process (SDAPP) Indoor Environment Quality guidelines.

According to the SDAPP guidelines, best practice is achieved where 2% daylight factor is achieved across 30% of the floor area of the nominated area.

The calculation method is based on one simple formula to calculate a zone of compliance within a nominated room. The compliant zone is the area of the room achieving 2% daylight factor and can be calculated as follows:

$$\boldsymbol{Zone\ of\ Compliance = 2 \times h \times w}$$

$\boldsymbol{w}$ is the width of the glazing serving the room

$\boldsymbol{h}$ is the height of the window head above the desktop/table level

Windows serving the nominated area are required to have a minimum 40% VLT to use the formula.

The percentage of compliant area within the nominated area can then be easily calculated with the following formula:

$$\boldsymbol{Percentage\ of\ compliant\ area = \frac{Zone\ of\ Compliance}{Nominated\ Area} \times 100}$$

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Site Description

The proposed new internal bar areas, bistro, and offices will be assessed as part of this report. All existing spaces, unenclosed areas, and infrequently used zones such as toilets, cool rooms, and kitchen are excluded from the assessment. Karaoke areas are also excluded, as they may be subject to different daylight requirements.

The desktop/table level has been estimated to be 700mm.

See below for the mark-up of the compliant zone (cyan) within each nominated area (yellow).

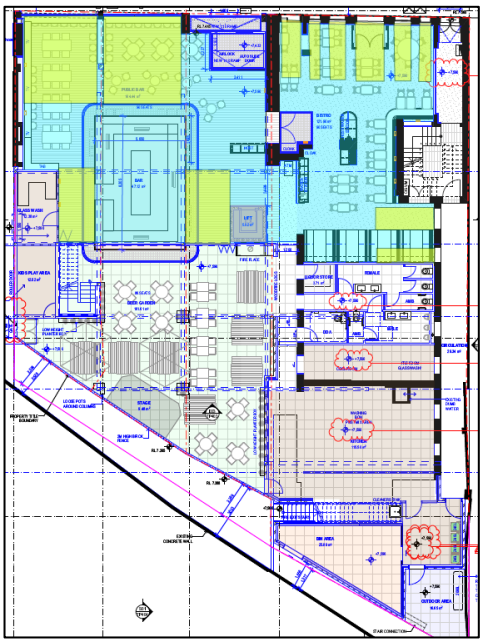

Figure 3: Compliance zone for ground floor.

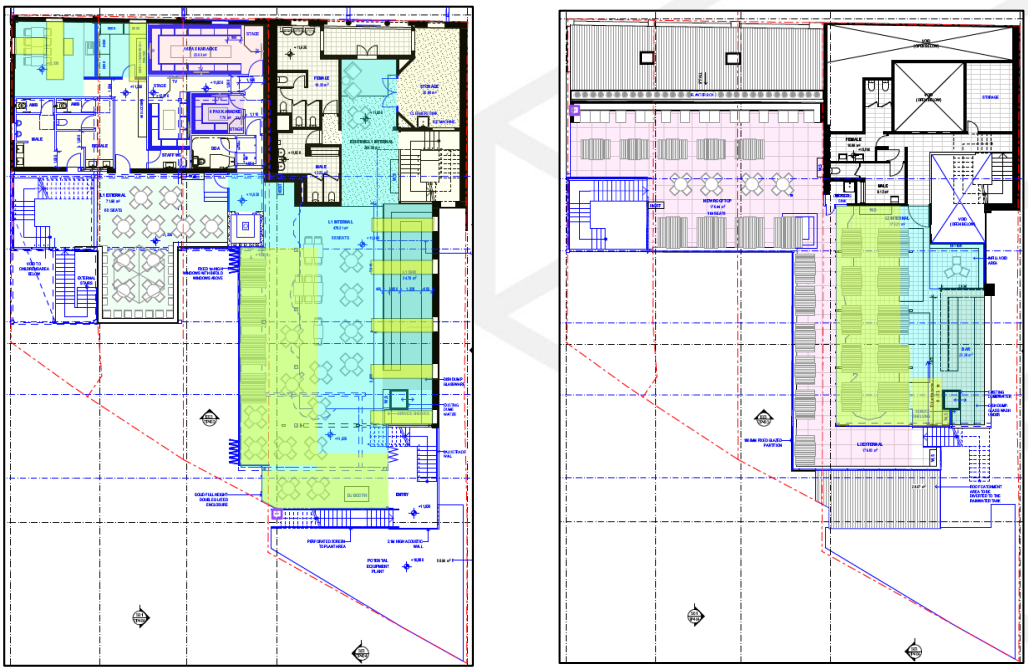

Figure 4: Compliance zone for first and second floor.

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	Nominated Areas (m^2)	Compliant Areas (m^2)	Compliant Areas (%)
GF BAR & BISTRO AREA	309	96	
FF OFFICE, INTERNAL BAR AREA	273	155	
2F INTERNAL BAR AREA	172	64	
TOTAL	582	251	43%

The green star hand calculation shows that the development will achieve and exceed SDAPP best practice requirement with the new regular use spaces achieving over 43% of floor area at 2% daylight factor.

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APPENDIX D – VOC & FORMALDEHYDE EMISSION LIMITS

The following table are an extract of the Green Star Design and as built submission guidelines:

Table 13.1.1: Maximum TVOC Limits for Paints, Adhesives and Sealants

Product Category	Max TVOC content in grams per litre (g/L) of ready to use product.
General purpose adhesives and sealants	50
Interior wall and ceiling paint, all sheen levels	16
Trim, varnishes and wood stains	75
Primers, sealers and prep coats	65
One and two pack performance coatings for floors	140
Acoustic sealants, architectural sealant, waterproofing membranes and sealant, fire retardant sealants and adhesives	250
Structural glazing adhesive, wood flooring and laminate adhesives and sealants	100

The product complies with the Total VOC (TVOC) limits specified in the Table below.

Carpet Test Standards and TVOC Emissions Limits

Test protocol	Limit
ASTM D5116 - Total VOC limit	0.5mg/m^2 per hour
ASTM D5116 - 4-PC (4-Phenylcyclohexene)	0.05mg/m^2 per hour
ISO 16000 / EN 13419 - TVOC at three days	0.5 mg/m^2 per hour
ISO 10580 / ISO/TC 219 (Document N238) - TVOC at 24 hours	0.5mg/m^2 per hour

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Table 13.2: Formaldehyde Emission Limit Values for Engineered Wood Products

Test Protocol	Emission Limit/ Unit of Measurement
AS/NZS 2269:2004, testing procedure AS/NZS 2098.11:2005 method 10 for Plywood	≤1mg/ L
AS/NZS 1859.1:2004 - Particle Board, with use of testing procedure AS/NZS 4266.16:2004 method 16	≤1.5 mg/L
AS/NZS 1859.2:2004 - MDF, with use of testing procedure AS/NZS 4266.16:2004 method 16	≤1mg/ L
AS/NZS 4357.4 - Laminated Veneer Lumber (LVL)	≤1mg/ L
Japanese Agricultural Standard MAFF Notification No.701 Appendix Clause 3 (11) - LVL	≤1mg/ L
JIS A 5908:2003- Particle Board and Plywood, with use of testing procedure JIS A 1460	≤1mg/ L
JIS A 5905:2003 - MDF, with use of testing procedure JIS A 1460	≤1mg/ L
JIS A1901 (not applicable to Plywood, applicable to high pressure laminates and compact laminates)	≤0.1 mg/m²hr*
ASTM D5116 (applicable to high pressure laminates and compact laminates)	≤0.1 mg/m²hr
ISO 16000 part 9, 10 and 11 (also known as EN 13419), applicable to high pressure laminates and compact laminates	≤0.1 mg/m²hr (at 3 days)
ASTM D6007	≤0.12mg/m³**
ASTM E1333	≤0.12mg/m³***
EN 717-1 (also known as DIN EN 717-1)	≤0.12mg/m³
EN 717-2 (also known as DIN EN 717-2)	≤3.5mg/m²hr

*mg/m²hr may also be represented as mg/m²/hr.

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APPENDIX E – BESS ASSESSMENT

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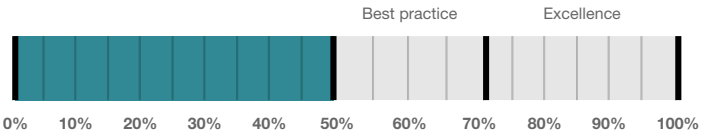
BESS Report

Built Environment Sustainability Scorecard

This BESS report outlines the sustainable design commitments of the proposed development at 100 Swan St Richmond Victoria 3121. The BESS report and accompanying documents and evidence are submitted in response to the requirement for a Sustainable Design Assessment or Sustainability Management Plan at Yarra Ranges Shire Council.

Note that where a Sustainability Management Plan is required, the BESS report must be accompanied by a report that further demonstrates the development's potential to achieve the relevant environmental performance outcomes and documents the means by which the performance outcomes can be achieved.

Your BESS Score

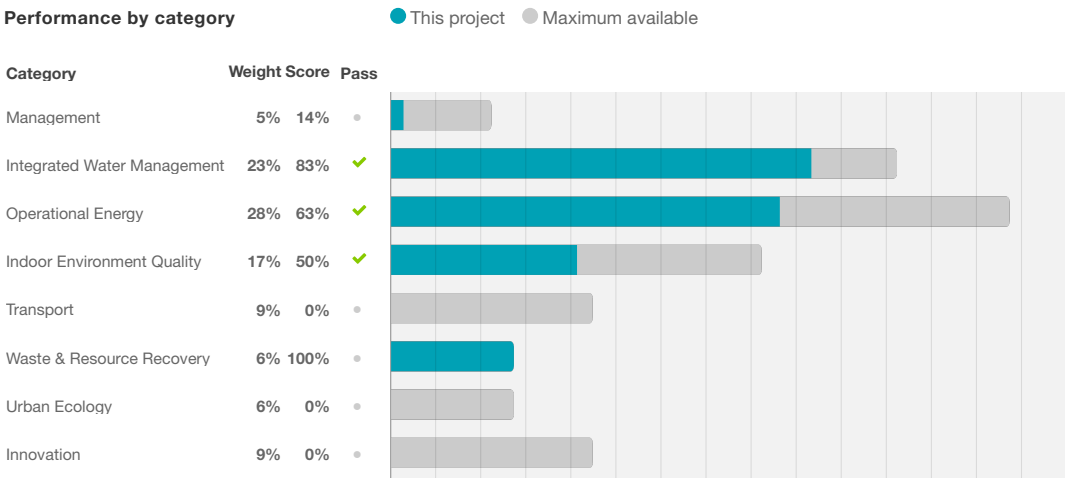


50%

Project details

Name	Richmond Club Hotel
Address	100 Swan St Richmond Victoria 3121
Project ID	0C996FF2-R4
BESS Version	BESS-9
Date	23 April 2026
Software version	2.3.0-B.650
Site type	Non-residential development
Account	wali@fraterconsultingservices.com.au
Application no.	
Site area	845 m²
Building floor area	1,346 m²

Performance by category



Buildings

Name	Height	Footprint	% of total footprint
RICHMOND CLUB HOTEL	3	1,347 m^2	100%

Dwellings & Non Res Spaces

Non-Res Spaces

Name	Quantity	Area	Building	% of total area
Shop				
RICHMOND CLUB HOTEL	1	1,347 m^2	RICHMOND CLUB HOTEL	100%
Total	**1**	**1,346 m^2**	**100%**	

Supporting Evidence

Shown on Floor Plans

Credit	Requirement	Response	Status
Integrated Water Management 2.1	Location of any stormwater management systems (rainwater tanks, raingardens, buffer strips)		-
Operational Energy 4.2	Location and size of solar photovoltaic system		-
Waste & Resource Recovery 2.1	Location of food and garden waste facilities		-
Waste & Resource Recovery 2.2	Location of recycling facilities		-

Supporting Documentation

Credit	Requirement	Response	Status
Integrated Water Management 2.1	STORM report or MUSIC model		-
Operational Energy 1.1	Energy Report showing calculations of reference case and proposed buildings		-
Operational Energy 3.7	Average lighting power density and lighting type(s) to be used		-
Operational Energy 4.2	Specifications of the solar photovoltaic system(s)		-
Indoor Environment Quality 1.4	A short report detailing assumptions used and results achieved.		-
Waste & Resource Recovery 1.1	Details regarding how the existing building is being reused on-site		-

Credit summary

Management Overall contribution 4.5%

	14%	
1.1 Pre-Application Meeting	0%	
2.3 Thermal Performance Modelling - Non-Residential	0%	
3.2 Metering - Non-Residential	N/A	Scoped Out
		ONLY ONE TENANT
3.3 Metering - Common Areas	0%	
4.1 Building Users Guide	100%	

IWM Overall contribution 22.5%

	83%	**Pass**
1.1 Potable Water Use	71%	Achieved
2.1 Stormwater Treatment	100%	Achieved
3.1 Water Efficient Landscaping	0%	
4.1 Building Systems Water Use	N/A	Scoped Out
		N/A

Operational Energy Overall contribution 27.5%

	Minimum required 50% **63%**	**Pass**
1.1 Thermal Performance Rating - Non-Residential	37%	
2.1 Greenhouse Gas Emissions	100%	
2.2 Peak Demand	100%	
2.6 Electrification	0%	Disabled
	Credit is available when the energy supply is set to all-electric (no gas or wood).	
2.7 Energy consumption	100%	
3.1 Carpark Ventilation	N/A	Scoped Out
		n/a
3.2 Hot Water - Non-Residential	100%	
3.7 Internal Lighting - Non-Residential	100%	
4.1 Combined Heat and Power (cogeneration / trigeneration)	N/A	Scoped Out
	No cogeneration or trigeneration system in use.	
4.2 Renewable Energy Systems - Solar	100%	
4.4 Renewable Energy Systems - Other	N/A	Scoped Out
	No other (non-solar PV) renewable energy is in use.	

IEQ Overall contribution 16.5%

	Minimum required 50%	50%	Pass
1.4 Daylight Access - Non-Residential		43%	✔ Achieved
2.3 Ventilation - Non-Residential		83%	✔ Achieved
3.4 Thermal comfort - Shading - Non-Residential		0%	
3.5 Thermal Comfort - Ceiling Fans - Non-Residential		0%	
4.1 Air Quality - Non-Residential		100%	

Transport Overall contribution 9.0%

	0%	
1.4 Bicycle Parking - Non-Residential	0%	
1.5 Bicycle Parking - Non-Residential Visitor	0%	
1.6 End of Trip Facilities - Non-Residential	0%	⊘ Disabled
	Credit 1.4 must be complete first.	
2.1 Electric Vehicle Infrastructure	N/A	⌖ Scoped Out
	n/a	
2.3 Motorbikes / Mopeds	N/A	⌖ Scoped Out
	n/a	

Waste & Resource Recovery Overall contribution 5.5%

	100%
1.1 Construction Waste - Building Re-Use	100%
2.1 Operational Waste - Food & Garden Waste	100%
2.2 Operational Waste - Convenience of Recycling	100%

Urban Ecology Overall contribution 5.5%

	0%
1.1 Communal Spaces	0%
2.1 Vegetation	0%
2.2 Green Roofs	0%
2.3 Green Walls and Facades	0%
3.2 Food Production - Non-Residential	0%

Innovation Overall contribution 9.0%

	0%
1.1 Innovation	0%

Credit breakdown

Management Overall contribution 4.5%

14%

1.1 Pre-Application Meeting	0%
Score Contribution	This credit contributes 42.9% towards the category score.
Criteria	Has an ESD professional been engaged to provide sustainability advice from schematic design to construction? AND Has the ESD professional been involved in a pre-application meeting with Council?
Question	Criteria Achieved ?
Project	No
2.3 Thermal Performance Modelling - Non-Residential	0%
Score Contribution	This credit contributes 28.6% towards the category score.
Criteria	Has a preliminary facade assessment been undertaken in accordance with NCC2022 Section J4D6?
Question	Criteria Achieved ?
Shop	No
Criteria	Has preliminary modelling been undertaken in accordance with either NCC2022 Section J (Energy Efficiency), NABERS or Green Star?
Question	Criteria Achieved ?
Shop	No
3.2 Metering - Non-Residential	N/A Scoped Out
	ONLY ONE TENANT
This credit was scoped out	ONLY ONE TENANT
3.3 Metering - Common Areas	0%
Score Contribution	This credit contributes 14.3% towards the category score.
Criteria	Have all major common area services been separately submetered?
Question	Criteria Achieved ?
Shop	No
4.1 Building Users Guide	100%
Score Contribution	This credit contributes 14.3% towards the category score.
Criteria	Will a building users guide be produced and issued to occupants?
Question	Criteria Achieved ?
Project	Yes

IWM Overall contribution 22.5%

83% ✔ Pass

Do you have a reticulated third pipe or an on-site water recycling system?:	No
Are you installing a swimming pool?:	No

Stormwater profile

Which stormwater modelling software are you using?:	Melbourne Water STORM tool
STORM score achieved:	100
Flow:	-
Total Suspended Solids:	-
Total Phosphorus:	-
Total Nitrogen:	-

Rainwater tank profile

What is the total roof area connected to the rainwater tank?:	
Rainwater Tank 1	374 m²
	-
Tank Size:	
Rainwater Tank 1	10,000 Litres
	-
Irrigation area connected to tank:	
Rainwater Tank 1	0.0 m²
	-
Is connected irrigation area a water efficient garden?:	
Rainwater Tank 1	No
	-
Other external water demand connected to tank?:	
Rainwater Tank 1	0.0 Litres/Day
	-

Fixtures, fittings & connections profile

Building:	RICHMOND CLUB HOTEL
Showerhead:	Scope out
Bath:	Scope out
Kitchen Taps:	>= 5 Star WELS rating
Bathroom Taps:	>= 5 Star WELS rating
Dishwashers:	>= 5 Star WELS rating
WC:	>= 4 Star WELS rating
Urinals:	>= 5 Star WELS rating
Washing Machine Water Efficiency:	Scope out
Which non-potable water source is the dwelling/space connected to?:	Rainwater Tank 1
Non-potable water source connected to Toilets:	Yes

Non-potable water source connected to Laundry (washing machine):	No
Non-potable water source connected to Hot Water System:	No

1.1 Potable Water Use	71% ✔ Achieved
Score Contribution	This credit contributes 33.3% towards the category score.
Criteria	What is the reduction in total potable water use due to efficient fixtures, appliances, rainwater use and recycled water use? To achieve points in this credit there must be >25% potable water reduction.
Output	Reference
Project	1964 kL
Output	Proposed (excluding rainwater and recycled water use)
Project	1315 kL
Output	Proposed (including rainwater and recycled water use)
Project	1011 kL
Output	% Reduction in Potable Water Consumption
Project	48 %
Output	% of connected demand met by rainwater
Project	91 %
Output	How often does the tank overflow?
Project	Never / Rarely
Output	Opportunity for additional rainwater connection
Project	265 kL

2.1 Stormwater Treatment	100% ✔ Achieved
Score Contribution	This credit contributes 60% towards the category score.
Criteria	Has best practice stormwater management been demonstrated?
Output	Min STORM Score
Project	100
Output	STORM Score
Project	100

3.1 Water Efficient Landscaping	0%
Score Contribution	This credit contributes 6.7% towards the category score.
Criteria	Will water efficient landscaping be installed?
Question	Criteria Achieved ?
Project	No

4.1 Building Systems Water Use	N/A ✣ Scoped Out
	N/A
This credit was scoped out	N/A

Operational Energy Overall contribution 27.5%

		Minimum required 50%	**63%**	✔ **Pass**

Project profile	
Use the BESS Deem to Satisfy (DtS) method for Non-residential spaces?:	Yes
Are you installing any renewable energy system(s) (other than solar photovoltaic)?:	No
Energy Supply:	Electricity & Natural Gas
Are you installing a cogeneration or trigeneration system?:	No
Solar Photovoltaic system profile	
System Size (lesser of inverter and panel capacity): SPV SYSTEM FOR THE NEW ROOF AND NEW AREAS	7.0 kW peak
Orientation (which way is the system facing)?: SPV SYSTEM FOR THE NEW ROOF AND NEW AREAS	North
Inclination (angle from horizontal): SPV SYSTEM FOR THE NEW ROOF AND NEW AREAS	10.0 Angle (degrees)
Non-residential Deemed-to-Satisfy profile	
Do all exposed floors and ceilings (forming part of the envelope) demonstrate meeting the required NCC2022 insulation levels (total R-value upwards and downwards)?:	Yes
Does all wall and glazing demonstrate meeting the required NCC2022 facade calculator (or better than the total allowance)?:	Yes
Are heating and cooling systems within one Star of the most efficient equivalent capacity unit available, or Coefficient of Performance (CoP) & Energy Efficiency Ratios (EER) not less than 85% of the CoP & EER of the most efficient equivalent capacity unit available?:	Yes
Are water heating systems within one star of the best available, or 85% or better than the most efficient equivalent capacity unit?:	Yes

1.1 Thermal Performance Rating - Non-Residential		37%
Score Contribution	This credit contributes 36.4% towards the category score.	
Criteria	What is the % reduction in heating and cooling energy consumption against the reference case (NCC2022 Section J)?	
2.1 Greenhouse Gas Emissions		100%
Score Contribution	This credit contributes 9.1% towards the category score.	
Criteria	What is the % reduction in annual greenhouse gas emissions against the benchmark?	
2.2 Peak Demand		100%
Score Contribution	This credit contributes 4.5% towards the category score.	
Criteria	What is the % reduction in the instantaneous (peak-hour) demand against the benchmark?	

2.6 Electrification	0%	Disabled
	Credit is available when the energy supply is set to all-electric (no gas or wood).	

This credit is disabled	Credit is available when the energy supply is set to all-electric (no gas or wood).

2.7 Energy consumption	100%

Score Contribution	This credit contributes 18.2% towards the category score.
Criteria	What is the % reduction in annual energy consumption against the benchmark?

3.1 Carpark Ventilation	N/A	Scoped Out
	n/a	

This credit was scoped out	n/a

3.2 Hot Water - Non-Residential	100%

Score Contribution	This credit contributes 4.5% towards the category score.
Criteria	What is the % reduction in annual energy consumption (gas and electricity) of the hot water system against the benchmark?

3.7 Internal Lighting - Non-Residential	100%

Score Contribution	This credit contributes 9.1% towards the category score.
Criteria	Does the maximum illumination power density (W/m2) in at least 90% of the area of the relevant building class meet the requirements in Table J7D3a of the NCC 2022 Vol 1?
Question	Criteria Achieved ?
Shop	Yes

4.1 Combined Heat and Power (cogeneration / trigeneration)	N/A	Scoped Out
	No cogeneration or trigeneration system in use.	

This credit was scoped out	No cogeneration or trigeneration system in use.

4.2 Renewable Energy Systems - Solar	100%

Score Contribution	This credit contributes 4.5% towards the category score.
Criteria	What % of the estimated energy consumption of the building class it supplies does the solar power system provide?
Output	Solar Power - Energy Generation per year
Shop	8,483 kWh
Output	% of Building's Energy
Shop	5 %

4.4 Renewable Energy Systems - Other	N/A	Scoped Out
	No other (non-solar PV) renewable energy is in use.	

This credit was scoped out	No other (non-solar PV) renewable energy is in use.

IEQ Overall contribution 16.5%

	Minimum required 50%	50%	✔ Pass

1.4 Daylight Access - Non-Residential		43%	✔ Achieved
Score Contribution	This credit contributes 35.3% towards the category score.		
Criteria	What % of the nominated floor area has at least 2% daylight factor?		
Question	Percentage Achieved?		
Shop	43 %		
2.3 Ventilation - Non-Residential		83%	✔ Achieved
Score Contribution	This credit contributes 35.3% towards the category score.		
Criteria	What % of the regular use areas are effectively naturally ventilated?		
Question	Percentage Achieved?		
Shop	60 %		
Criteria	What increase in outdoor air is available to regular use areas compared to the minimum required by AS 1668.2:2012?		
Question	Percentage Achieved?		
Shop	70 %		
Criteria	What CO2 concentrations are the ventilation systems designed to achieve, to monitor and to maintain?		
Question	Value		
Shop	600 ppm		
3.4 Thermal comfort - Shading - Non-Residential		0%	
Score Contribution	This credit contributes 17.6% towards the category score.		
Criteria	What percentage of east, north and west glazing to regular use areas is effectively shaded?		
Question	Percentage Achieved?		
Shop	0 %		
3.5 Thermal Comfort - Ceiling Fans - Non-Residential		0%	
Score Contribution	This credit contributes 5.9% towards the category score.		
Criteria	What percentage of regular use areas in tenancies have ceiling fans?		
Question	Percentage Achieved?		
Shop	0 %		
4.1 Air Quality - Non-Residential		100%	
Score Contribution	This credit contributes 5.9% towards the category score.		

Criteria	Do all paints, sealants and adhesives meet the maximum total indoor pollutant emission limits?
Question	Criteria Achieved ?
Shop	Yes

Criteria	Does all carpet meet the maximum total indoor pollutant emission limits?
Question	Criteria Achieved ?
Shop	Yes

Criteria	Does all engineered wood meet the maximum total indoor pollutant emission limits?
Question	Criteria Achieved ?
Shop	Yes

Transport Overall contribution 9.0%

	0%

1.4 Bicycle Parking - Non-Residential			0%
Score Contribution	This credit contributes 50% towards the category score.		
Criteria	Have the planning scheme requirements for employee bicycle parking been exceeded by at least 50% (or a minimum of 2 where there is no planning scheme requirement)?		
Question	Criteria Achieved ?		
Shop	No		
Question	Bicycle Spaces Provided ?		
Shop	-		
1.5 Bicycle Parking - Non-Residential Visitor			0%
Score Contribution	This credit contributes 25% towards the category score.		
Criteria	Have the planning scheme requirements for visitor bicycle parking been exceeded by at least 50% (or a minimum of 1 where there is no planning scheme requirement)?		
Question	Criteria Achieved ?		
Shop	No		
Question	Bicycle Spaces Provided ?		
Shop	-		
1.6 End of Trip Facilities - Non-Residential			0% ⊘ Disabled
			Credit 1.4 must be complete first.
This credit is disabled	Credit 1.4 must be complete first.		
2.1 Electric Vehicle Infrastructure			N/A ⟡ Scoped Out
			n/a
This credit was scoped out	n/a		
2.3 Motorbikes / Mopeds			N/A ⟡ Scoped Out
			n/a
This credit was scoped out	n/a		

Waste & Resource Recovery **Overall contribution 5.5%**

	100%

1.1 Construction Waste - Building Re-Use		100%
Score Contribution	This credit contributes 33.3% towards the category score.	
Criteria	If the development is on a site that has been previously developed, has at least 30% of the existing building been re-used?	
Question	Criteria Achieved ?	
Project	Yes	

2.1 Operational Waste - Food & Garden Waste		100%
Score Contribution	This credit contributes 33.3% towards the category score.	
Criteria	Are facilities provided for on-site management of food and garden waste?	
Question	Criteria Achieved ?	
Project	Yes	

2.2 Operational Waste - Convenience of Recycling		100%
Score Contribution	This credit contributes 33.3% towards the category score.	
Criteria	Are the recycling facilities at least as convenient for occupants as facilities for general waste?	
Question	Criteria Achieved ?	
Project	Yes	

Urban Ecology Overall contribution 5.5%

	0%

1.1 Communal Spaces		0%
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	Is there at least the following amount of common space measured in square meters : * 1m² for each of the first 50 occupants * Additional 0.5m² for each occupant between 51 and 250 * Additional 0.25m² for each occupant above 251?	
Question	Common space provided	
Shop	-	
Output	Minimum Common Space Required	
Shop	92 m²	

2.1 Vegetation		0%
Score Contribution	This credit contributes 50% towards the category score.	
Criteria	How much of the site is covered with vegetation, expressed as a percentage of the total site area?	
Question	Percentage Achieved ?	
Project	0 %	

2.2 Green Roofs		0%
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	Does the development incorporate a green roof?	
Question	Criteria Achieved ?	
Project	No	

2.3 Green Walls and Facades		0%
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	Does the development incorporate a green wall or green façade?	
Question	Criteria Achieved ?	
Project	No	

3.2 Food Production - Non-Residential		0%
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	What area of space per occupant is dedicated to food production?	
Question	Food Production Area	
Shop	-	
Output	Min Food Production Area	
Shop	34 m²	

Innovation Overall contribution 9.0%

	0%

1.1 Innovation	0%
Score Contribution	This credit contributes 100% towards the category score.
Criteria	What percentage of the Innovation points have been claimed (10 points maximum)?

Disclaimer

The Built Environment Sustainability Scorecard (BESS) has been provided for the purpose of information and communication. While we make every effort to ensure that material is accurate and up to date (except where denoted as 'archival'), this material does in no way constitute the provision of professional or specific advice. You should seek appropriate, independent, professional advice before acting on any of the areas covered by BESS.

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